

REMARKS

Claims 1-33 are currently pending in the application. Claims 1, and 32-33 have been amended to clarify the claim language. No new matter has been added. Claims 2-31 remain unchanged. Applicants thank the Examiner for the indication of allowability with respect to claims 21-23.

Drawings

1. Step (602) of Figure 6 has been edited to clarify the drawing.
2. Figure 1 has been labeled as "Prior Art" as requested.

Claim rejections

I. 112 Rejection

1. Claim 1-33 have been rejected for being indefinite due to lack of antecedent basis. Claims 1, and 32-33 have been amended. Claims 2-31 depend on claim 1 and as such are amended as well.

2. Claims 1-32, and 33 have been rejected and being indefinite because they lack the steps to arrive at a method for pipelining tables. Applicants respectfully disagree. The recited method in the claims is fully supported in the specification. For example, page 12, paragraph 2 and Fig. 4 describe the process of pipelining a table function that is reflected in the claims. As such, the preamble and methods of claims 1, 32, and 33 do recite a method, system, and process for pipelining table functions.

II. 102 Rejection

Claims 1-6, 13-17, 20, 24, 32-33 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,241,648 to Cheng et al. (issued 31 August 1993). Applicants

respectfully submit that “for anticipation under 35 U.S.C. 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present.” MPEP 706.02, Eighth Edition.

1. The Office action states that Cheng discloses “a) performing a set up operation when the table function is called (See col. 6, lines 8-33).” Applicants respectfully disagree. Applicants submit that Cheng discloses the beginning of the execution of a cursor for a hybrid join technique. For example, the cited passage of Cheng discloses:

The hybrid join technique of this invention is illustrated in Tables I, II, and III, which are explained with reference to an example join of the Tables 10 and 12. The example is illustrated in FIG. 4. The tables indicate the three phases of the technique of this invention. The three tables are presented in the form of pseudo-code which assumes an underlying SQL type system. In the pseudo code, the outer table (table 12) is referred to as "T1", while the inner table (table 10) is referred to as "T2". As is known, an SQL system employs constructs called "cursors" to obtain sequential access to data base records. In this regard, a cursor is defined by the SELECT statement of a query. In SQL programming, an OPEN statement is employed to begin execution of the cursor declared by the SELECT statement. The cursor is applied to the data base structures designated in the FROM clause of the query. The OPEN statement accesses the designated structures, obtaining designated fields of records satisfying the join and local conditions. Conventionally, OPEN cursor processing proceeds recursively until all of the designated structures have been completely accessed. The OPEN procedure assembles a set of intermediate results which are used to retrieve records during the FETCH phase of cursor processing.

Column 6, lines 8-33 (emphasis added).

In this passage Cheng discusses “a hybrid join technique” contained in “a cursor” that “is defined by the SELECT statement of a query” and “an OPEN statement is employed to begin execution of the cursor declared by the SELECT statement.” The hybrid join technique of Cheng is distinct from the table function of the instant application. The hybrid join technique as described by Cheng “joins two tables of relational data base management systems in a three-stage process.” Column 4, lines 40-42. A table function as known in the art is a class of functions that at least produce a set of rows or data objects as output that then can be accessed as if they were a table (e.g., used in FROM, WHERE, or GROUP BY statements). The claim

limitation is “a) performing a setup operation when the table function is called.” In contrast, Cheng is employing an OPEN statement to begin execution of a cursor for a hybrid join technique. As the hybrid join technique of Cheng is not a table function, and as Cheng is silent as to setup operations, Cheng does not disclose “a) performing a setup operation when the table function is called” as recited in an element of amended claim 1.

2. The Office action further states that Cheng discloses “c) sending the subset of the output data to a first consumer of the output data, wherein first consumer is the table function (See col. 6, line 55 through col. 7, lines 68).” Applicants respectfully disagree. Applicants submit that Cheng discloses the open cursor processing creates an intermediate result table that is sent to be sorted, is ANDed, is prefetched, and is fetched. For example, Cheng Discloses:

The OPEN procedure assembles a set of intermediate results which are used to retrieve records during the FETCH phase of cursor processing.

The FETCH statement in SQL processing obtains the records based upon the intermediate results and constructs a join table comprising the fields designated in the SELECT statement.

Column 6, lines 29-36.

Cheng further discloses:

TABLE I

OPEN CURSOR PROCESSING

100 Open a scan providing sorted (or mostly sorted) access
to T1.

101 Open a scan on the T2 index.

...

107 Build the composite rows (T2 RID, T1 data)
in the intermediate result table.

107a Send to sort the intermediate result table on
T2 RID.

108 End.

123 "AND" the RIDs with those in the intermediate
result table.

125 If EOF (on either T1 or T2), Then

126 Close the scan on T1.

127 Close the scan on the T2 index.
130 Open a sequential prefetch scan on T2.
131 Open a sequential prefetch scan on the intermediate
result table.

TABLE II

FETCH CURSOR PROCESSING

200 Do until (row-returned .vertline. EOF).
201 Fetch the next row in the intermediate result table.
202 If the T2 RID is the same as the last one, Then
...
211 End.

Column 6, line 55 to column 7, line 30 (emphasis added).

These passages of Cheng show that the OPEN cursor creates an intermediate table in pseudo code line 107. The intermediate table is sent to be sorted in pseudo code line 107a, and has a sequential prefetched scan opened on it in pseudo code line 131. The intermediate table is then fetched by the FETCH cursor processing in pseudo code line 201. A table function is distinct from sorting, ANDing, and fetching. A table function as known in the art is a class of functions that at least produce a set of rows or data objects as output that then can be accessed as if they were a table (e.g., used in FROM, WHERE, or GROUP BY statements). Sorting groups data in a specified order. ANDing is a logical operator. Fetching is a data retrieval operator. None of these are table functions. As Cheng discloses a hybrid join technique in which open cursor processing creates an intermediate result table that is sent to be sorted, is ANDed, is prefetched, and is fetched, Cheng does not disclose “c) sending the subset of the output data to a first consumer of the output data, wherein first consumer is the table function,” as recited in an element of claim 1.

3. Claims 32-33 recite substantially the same elements as claim 1, and are therefore, patentable over Cheng for at least the same reasons. Claims 5-6, 13-17, 20, 24 depend on claim 1 and are patentable over Cheng for at least the same reasons.

III. 103 Rejection

Applicants submit that the Office action failed to establish a *Prima Facie* case of obviousness.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation that either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally the prior art reference (or references when combined) must teach or suggest the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success, must both be found in the prior art, not the applicant's disclosure. In re Vaack, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

MPEP, 2143, paragraph 1-2.

In regard to the application of the three basic criteria in this case, there is insufficient motivation to combine the secondary references with Cheng (a hybrid join technique), there is not a reasonable expectation of success in the combinations, and the references in combination do not teach all the claimed limitations.

1. Claims 11-12, 18-19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Cheng in view of U.S. Patent 5,241,648 to Danneels et al. (issued 25 April 1995). Cheng is directed to a hybrid join technique. Danneels is directed to a method and system for loading a library from a server to a client. A client server system for loading a library deals with transferring files over a network. A hybrid join technique joins two tables of relational data base management systems in a three-stage process. These are disparate technology areas. Applicants respectfully submit that there is no motivation to combine, nor an expectation of success to combine a client server library loading system with a hybrid join technique.

2. Claims 25-28 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Cheng in view of U.S. Patent 4,803,613 to Kametani et al. (issued 7 February 1989). Kametani is directed to a master/slave apparatus for equipment (e.g., robot) control. Cheng is directed to a hybrid join technique. A master slave apparatus for equipment control deals with sending commands from the master module to the slave modules to move robot parts. A hybrid join

technique joins two tables of relational data base management systems in a three-stage process. These are disparate technology areas. Applicants respectfully submit that there is no motivation to combine, nor an expectation of success to combine an equipment control apparatus with a SQL hybrid join technique.

3. Claims 29-31 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Cheng in view of U.S. Patent 5,937,415 to Sheffield et al. (issued 10 August 1999). Sheffield is directed to a client/server system with improved methods for data replication. Cheng is directed to a hybrid join technique. Data replication deals with copying data from one table to another. A hybrid join technique joins two tables of relational data base management systems in a three-stage process. While these areas are both database related, they are disparate database functions. Replication is used for massive backup and security purposes, while the hybrid join technique is used to manipulate data. Applicants respectfully submit that there is no motivation to combine, nor an expectation of success to combine a data replication system with a hybrid join technique.

4. Claims 7-10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Cheng in view of U.S. Patent 6,052,699 to Huelsbergen et al. (issued 18 April 2000). Huelsbergen is directed a garbage collection technique for the concurrent operation of a mutator and a garbage collector. A garbage collection technique deals with background memory allocation in a database environment. Cheng is directed to a hybrid join technique. A hybrid join technique joins two tables of relational data base management systems in a three-stage process. While these two inventions are both database related, they are disparate database functions. A garbage collector is a background memory allocation operation, the hybrid join operation is a foreground data manipulation operation. Applicants respectfully submit that there is no motivation to combine, nor an expectation of success to combine a garbage collection system with a hybrid join technique.

5. Further, even if the secondary references of Danneels, Kametani, Sheffield, and Huelsbergen were properly combined with Cheng, the combinations would still lack the recited claimed elements. Therefore, a *prima facie* case has not been established and these combinations cannot be used to preclude patentability of claims 7-12, 18-19, and 25-31 under 103.

CONCLUSION

On the basis of the above remarks, reconsideration and allowance of the claims is believed to be warranted and such action is respectfully requested. If the Examiner has any questions or comments, the Examiner is respectfully requested to contact the undersigned at the number listed below.

Respectfully submitted,
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